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ARIZONA OCCUPATIONAL PROFILE

A Labor Market Information Publication of the Arizona Department of Economic Security

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UTAH
COCONINO
MOHAVE
KINGMAN
FLAGSTAFF
NAVAJO
APACHE
HOLBROOK
ST. JOHNS
CALIFORNIA
PRESCOTT
YAVAPAI
NEW MEXICO
PARKER
LA PAZ
GILA
PHOENIX
GLOBE
GREENLEE
CLIFTON
MARICOPA
FLORENCE
YUMA
SAFFORD
PINAL
YUMA
GRAHAM
TUCSON
PIMA
COCHISE
MEXICO
SANTA CRUZ
BISBEE
NOGALES
ARIZONA

OCCUPATIONAL PROFILE

The value of current and accurate occupational employment information has long been recognized by job seekers, public and private administrators, and those involved in training, recruiting, and counseling. A major source of this information in Arizona is the Occupational Employment Statistics (OES) Program - a cooperative effort between Arizona and the U.S. Bureau of Labor Statistics.

This Occupational Profile is one in a series of publications produced from information developed by the Occupational Employment Statistics survey. These publications represent one of several occupational employment information delivery systems incorporating OES survey data. The survey is used to collect employment data, by county, for over 1,000 occupations in Arizona. From these surveys, which require the cooperation of the Arizona business community, current employment in the various occupations is determined, and from this an occupational outlook is formulated. The Occupational Profiles contain the survey findings and examine, individually, the industries of Arizona.

Surveyed industries include:

Mining
Construction
Manufacturing
Transportation, Communications, and Public Utilities
Trade
Finance, Insurance, and Real Estate
Services
Government

For further information, or to comment on any aspect of this program, please write to the address on the back cover.

INDUSTRY INFORMATION

INDUSTRY DESCRIPTION

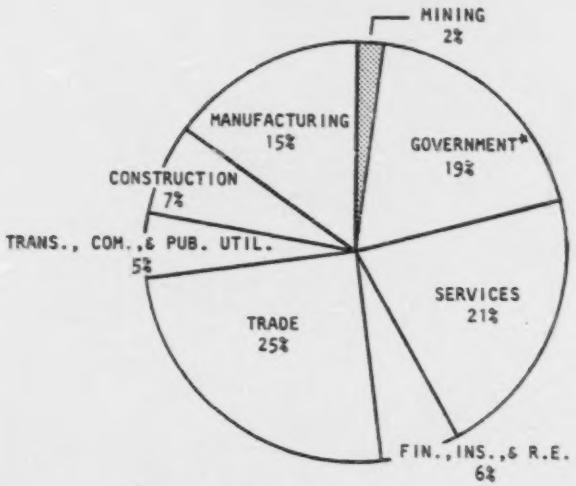
Establishments concerned with mining include firms that extract materials occurring naturally: solids, such as coal and ores; liquids, such as crude petroleum; and gases, such as natural gas. The term "mining" also includes exploration, quarrying, well operation, milling, and other preparation customarily done at the mine site or as a part of mining activity.

A detailed description of the types of firms surveyed is found in the Standard Industrial Classification (SIC) Manual[1] under codes 10 through 14.

INDUSTRY CHARACTERISTICS

Slightly more than 25,000 of Arizona's 1.2 million workers employed in May 1981 were directly associated with mining. This capital intensive industry's relatively small employment total belies the state's role as a major U.S. producer of mined products and the industry's economic significance to certain Arizona communities. Valued at nearly $2.5 billion

FIGURE 1: Arizona Nonagricultural Employment by Industry 1981



*includes education

in 1980, Arizona's mineral production accounted for nearly 10 percent of the total U.S. nonfuel mineral output of $25 billion.

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[1]Office of Management and Budget, *Standard Industrial Classification Manual*, 1972 Edition, pp. 31-43.

Although only 2 percent of Arizona's employment works in mining, mineral production ranked third in 1981 among major sources of Arizona income - behind manufacturing and tourism.

FIGURE 2: LEADING NONFUEL MINERAL PRODUCING STATES IN 1980

	Value (000's)	Percent of U.S. Total	Principal Minerals
Arizona	$2,425,714	9.7%	Copper, molybdenum, cement, silver
California	1,885,695	7.5	Cement, sand & gravel, boron minerals
Minnesota	1,782,310	7.1	Iron ore, sand & gravel, stone, lime
Texas	1,734,651	6.9	Cement, sulpher, stone, sand & gravel
Florida	1,508,754	6.0	Phosphate rock, stone, cement, sand & gravel
Michigan	1,485,450	5.9	Iron ore, cement, magnesium compounds, salt
Colorado	1,264,515	5.0	Molybdenum, cement, sand & gravel, silver

Source: U.S. Department of Interior, Bureau of Mines.

State and local government revenues provided by the Arizona copper industry alone totaled more than $124 million in 1979. School district revenues provided through property tax and the apportionment of educational excise taxes totaled $53.5 million.

FIGURE 3: ARIZONA'S SHARE OF U.S. OUTPUT 1980

Commodity	% Share of U.S. Output	Rank in Nation
Copper	66 %	1
Molybdenum	25	2
Silver	20	2
Pumice	21	2
Asbestos	NA	3
Gold	11	4

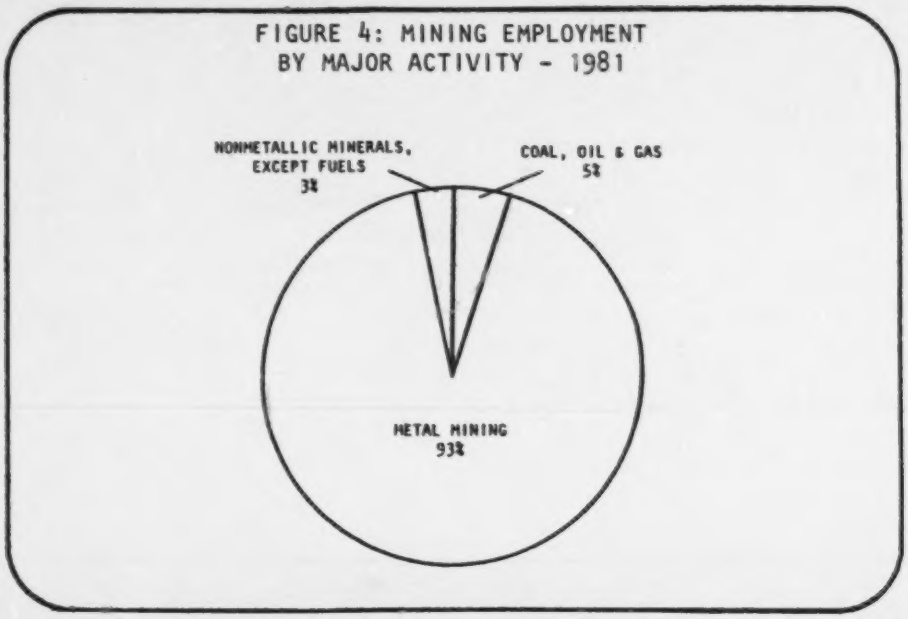
NA - Not available
Source: U.S. Dep't. of Int., Bureau of Mines.

The great majority of Arizona's mine workers are engaged in the extraction of metal ores - ninety-five percent of which are involved in the mining and milling of copper. In 1980, ten of the United States' fifteen leading copper producing mines were located in Arizona. Contributing 66 percent of the total U.S. production of copper in 1979, Arizona reinforced this country's position as the world's leading copper producer - followed by Chile, the U.S.S.R., Canada, Zambia, and Zaire. Arizona's lofty position as a producer of molybdenum, silver, and gold results primarily from efforts to recover these metals as by-products and coproducts of copper production. In 1980, Arizona's leading commodities in the nonmetals were sand and gravel, lime, and crushed stone.

Employing approximately 2,000 in 1981, firms mining fuels and nonmetallic minerals represented 7 percent of Arizona's mine workers. Miners of

bituminous coal accounted for the bulk of this employment and were followed by those mining sand and gravel.

FIGURE 4: MINING EMPLOYMENT
BY MAJOR ACTIVITY - 1981



Mining activities, and therefore employment, exist in every Arizona county. Dictated by the location of mineral deposits, most of the mining

FIGURE 5: MINING EMPLOYMENT
AND MINERAL PRODUCTION BY COUNTY

COUNTY	MINING EMPLOYMENT MAY 1981	NONFUEL MINERAL PRODUCTION VALUE 1979 (000's)	LEADING MINERALS PRODUCED IN 1979 BY ORDER OF VALUE
Pinal	7,750	$589,683	Copper, molybdenum, silver, gold, stone
Pima	7,700	914,846	Copper, molybdenum, cement, silver
Gila	2,900	253,024	Copper, molybdenum, silver, sand & gravel
Greenlee	2,650	385,755	Copper, silver, gold, lime, stone, sand & gravel
Navajo	1,150	2,942	Sand & gravel
Yavapai	1,050	199,699	Copper, cement, molybdenum, lime
Mohave	625	52,813	Copper, molybdenum, stone, silver, sand & gravel
Cochise	525	29,479	Copper, lime, stone, sand & gravel, silver
Maricopa	400	W	Sand & gravel, salt, lime, stone, clay
Graham	100	496	Sand & gravel, pumice
Apache	50	1,900	Pumice, sand & gravel, clays, stone
Coconino	50	2,521	Pumice, sand & gravel, stone
Yuma	50	W	Sand & gravel, stone, lead, silver, copper
Santa Cruz		W	Sand & gravel, tungsten
Undistributed [1]		57,323	

W - Withheld to avoid disclosing company proprietary data; included with "Undistributed".

[1] Includes value that cannot be assigned to specific counties and values indicated by W.

Source: U.S. Department of Interior, Bureau of Mines.

employment is concentrated in Pinal and Pima counties where copper deposits are located.

Firms mining copper tend to be much larger than those working other deposits. Although Pinal and Pima counties account for 62 percent of Arizona's mining employment, only 29 percent of all mining firms are found within the borders of these two counties. Arizona's thirty-three copper mining firms employed an average of 664 employees in 1981, while the fifty-five gold and silver mining establishments, for example, employed an average of four employees and had a wider geographical distribution.

Although statewide employment in mining is not substantial, the industry continues to be an important basic component in several counties and is the principal employer in some communities. In 1981, approximately 60 percent of Greenlee County's workers were employed by a mining company. In Pinal County, one of every four workers was employed in mining, while in Gila County the ratio was one in five.

FIGURE 6: VALUE OF MINERAL PRODUCTION BY COUNTY

	1977	1978	1979
Apache	$ W	$ 2,315,000	$ 1,900,000
Cochise	24,141,000	20,932,000	29,479,000
Coconino	W	W	2,521,000
Gila	141,722,000	175,340,000	253,024,000
Graham	W	W	496,000
Greenlee	W	264,204,000	385,755,000
Maricopa	W	W	W
Mohave	38,053,000	46,515,000	52,813,000
Navajo	2,815,000	3,294,000	2,942,000
Pima	629,607,000	595,005,000	914,846,000
Pinal	390,180,000	393,127,000	589,683,000
Santa Cruz	629,000	1,457,000	W
Yavapai	76,600,000	148,293,000	199,699,000
Yuma	W	W	W
Undistributed	251,039,000	54,144,000	57,323,000
TOTAL	$1,554,788,000	$1,704,633,000	$2,490,481,000

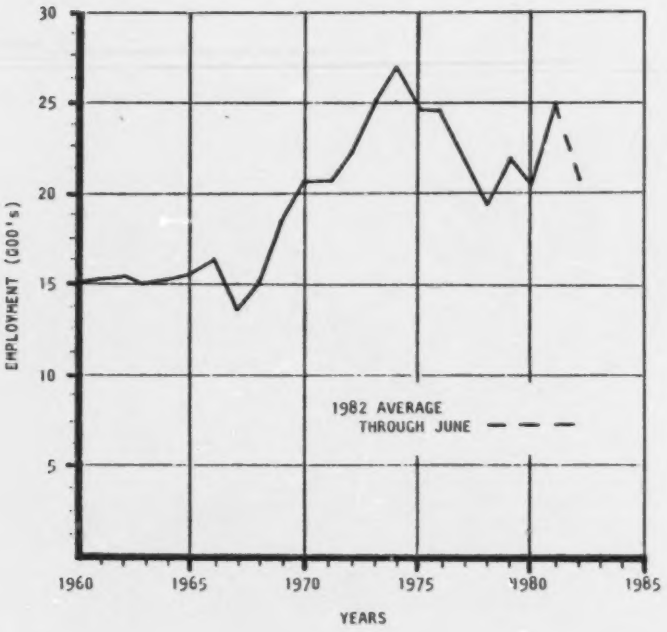
W - Withheld for reasons of disclosure.

Source: U.S. Department of Interior, Bureau of Mines.

INDUSTRY TRENDS

Although the long-term trend of Arizona's mining employment has been upward, it has, over the years, fluctuated greatly as it reacts to international forces affecting the price, demand, and supply of copper. Having doubled its employment between 1967 and 1974, mining employment subsequently followed a roller coaster trail--falling victim to the 1974-75 recession, cresting in 1981, and tumbling again amidst recessionary pressures in 1981-82.

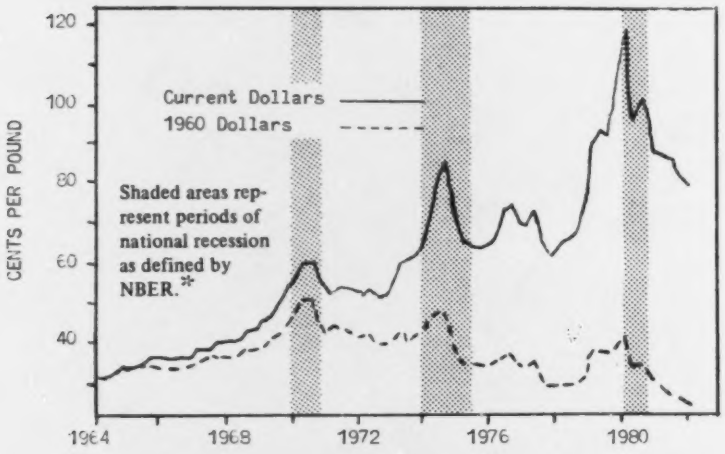
FIGURE 7: AVERAGE ANNUAL EMPLOYMENT IN MINING



Speculation in the commodities markets contributed significantly to the record level prices of copper and precious metals in the first few months of 1980. By years end, however, the effects of the copper strike, depressed automobile and housing markets, and reduced demand in manufacturing all contributed to the decline in copper, gold, and silver production. The following year (1981) saw employment in Arizona's mines grow substantially as the industry rebounded from low employment levels that resulted, to a great extent, from strikes in 1977 and 1980. Such growth (see figure 8) required a severe retrenchment in 1982 however, and

in the face of deteriorating market conditions employment was slashed to less than 19,000 by mid-year. Such employment levels (strike adjusted) had not been seen in the industry since early 1969. Copper prices in recent years ranged from $1.18 per pound in early 1980 to the mid-60-cents range in 1982 - well below production costs of approximately 90 cents a pound. Adjusted for inflation, copper prices in mid-1982 were lower than at anytime in the past 50 years.

FIGURE 8: PRICE OF COPPER, DOMESTIC DELIVERED



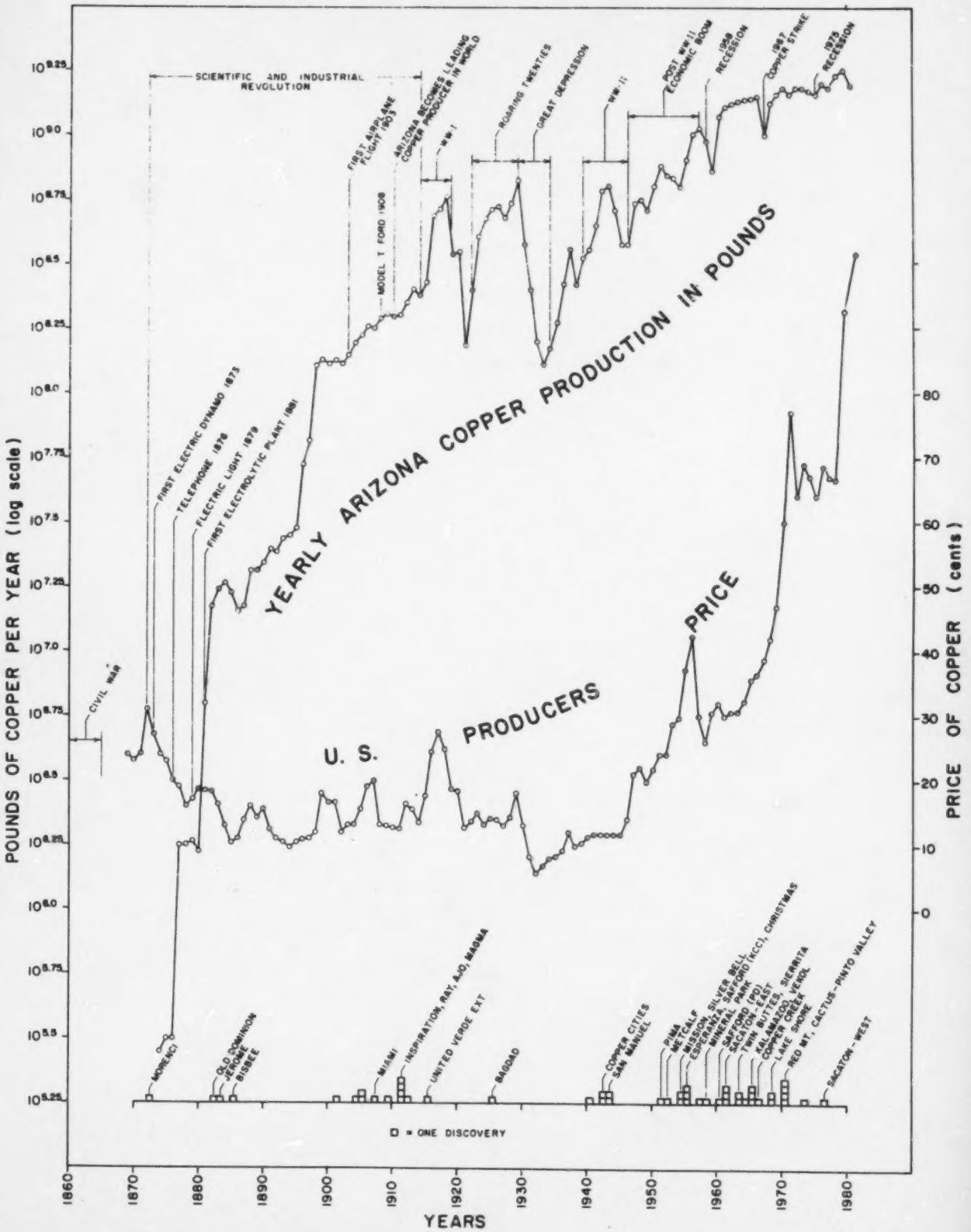
* *National Bureau of Economic Research*

Source: Division of Economic and Business Research, College of Business and Public Administration, University of Arizona.

Year-to-year employment fluctuations in the mining industry will continue to result from labor strife, international volatility of prices, and the industry's sensitivity to general business conditions. Domestic land use policies, and air and water conservation regulations will also affect mining's employment outlook. Although Arizona's copper industry has expended more than a half-billion dollars in the last decade to meet air quality regulations, compliance with standards of water and air-purity require continued industry attention and resources.

An ever-changing demand for copper will result from worldwide technological and social change. Contributing to a greater demand for copper is the trend to underground power distribution, mass-transit, electric cars, automation, and increased computer use. Resistance of copper alloys to the corrosive effects of seawater, and the metal's high heat transfer properties, make copper ideal for use in distillation processes used in seawater desalinization. Long-term trends inhibiting

FIGURE 9: HISTORY OF ARIZONA COPPER DEVELOPMENT



Source: Arizona Bureau of Geology and Mineral Technology.

copper consumption include the substitution of aluminum and copper-clad aluminum for copper, microminiaturization of communication circuitry, the use of fiber-optics and satellites in communications, and the metal's relatively high cost.

The recession notwithstanding, the long-term trend indicates continued growth in molybdenum production. Mined in conjunction with copper activities, molybdenum has, in recent years, been in stong demand for use principally as a hardening agent in steel, castirons, and superalloys.

FIGURE 10: MINERAL PRODUCTION IN ARIZONA (000's)

	1977	1978	1979	1980
Copper	$1,234,168	$1,306,866	$1,940,211	$1,709,997
Molybdenum . . .	120,497	W	213,065	341,965
Silver	31,546	35,844	82,941	116,984
Sand and Gravel	49,946	69,100	74,716	73,773
Stone	16,495	17,771	21,511	21,610
Lime	15,528	19,743	27,186	23,904
Gold	13,373	17,998	31,316	44,578
Gem Stones . . .	4,500	4,600	4,000	3,100
Pumice	1,226	3,130	2,367	3,228
All Other . . .	67,509	W	93,168	86,575
TOTAL	$1,554,788	$1,704,633	$2,490,481	$2,425,714

W - Withheld due to reasons of disclosure.
Source: U.S. Department of Interior, Bureau of Mines.

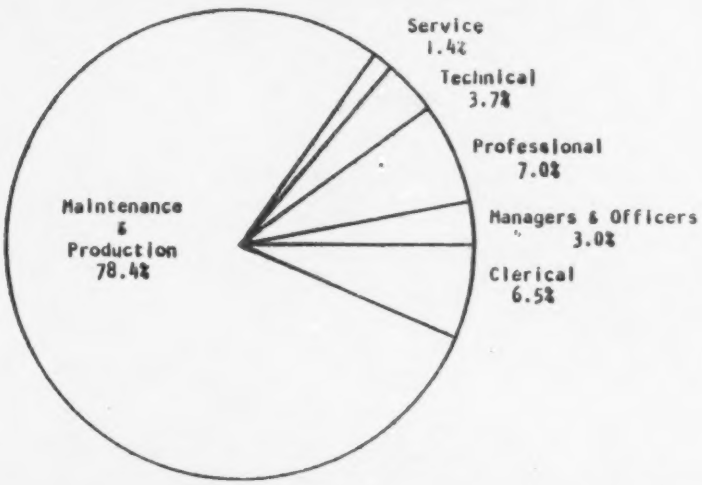
Employment change in copper mining between 1981 and 1985 will be insignificant, as the industry recovers from the low employment levels of 1982. Little growth and few "new" jobs will materialize during the period as mining firms rehire many of those laid-off during the most recent recession. The extent of the recovery, however, is difficult to predict. Expected to ride the coattails of a recovery in construction and manufacturing, and an improvement in the world economy, the eventual health of Arizona's mining industry will further be determined by worldwide copper production levels. Potential mine openings worldwide and efforts to expand exports in certain countries to maximize foreign exchange earnings from government-owned properties, even in times of world oversupply, will tend to keep prices down.

OCCUPATIONAL INFORMATION

OCCUPATIONAL ANALYSIS

Maintenance and production occupations dominate the mining industry - representing three of every four mining workers in Arizona. This occupational category encompasses workers with a wide range of skills and responsibilities and includes such occupations as truck drivers, trades

FIGURE 11: OCCUPATIONS IN MINING
MAY 1981



helpers, heavy equipment operators and electricians. Ranking a distant second and third to maintenance and production workers are professional workers (7 percent) and clerical workers (6.5 percent).

Notable in the professional category is the large number of engineers. Of the 1,700 professional workers reported in mining in May 1981, approximately 600 were engineers. Of the eight types reported, mining engineers and metallurgists/metallurgical engineers were most prominent - accounting for more than half of the total. Mining engineers are primarily involved in determining the location of minerals and ores, and planning for their extraction. Metallurgists and metallurgical engineers, on the other hand, investigate properties and treatments of metals to develop new alloys, production methods, and uses for the metals and alloys. Those involved in extractive metallurgy develop and control processes used in winning metals from their ores.

In the clerical workers category, secretaries, stock clerks and general office clerks are the three largest occupations.

FIGURE 12: MINING OCCUPATIONS
WITH THE GREATEST EMPLOYMENT

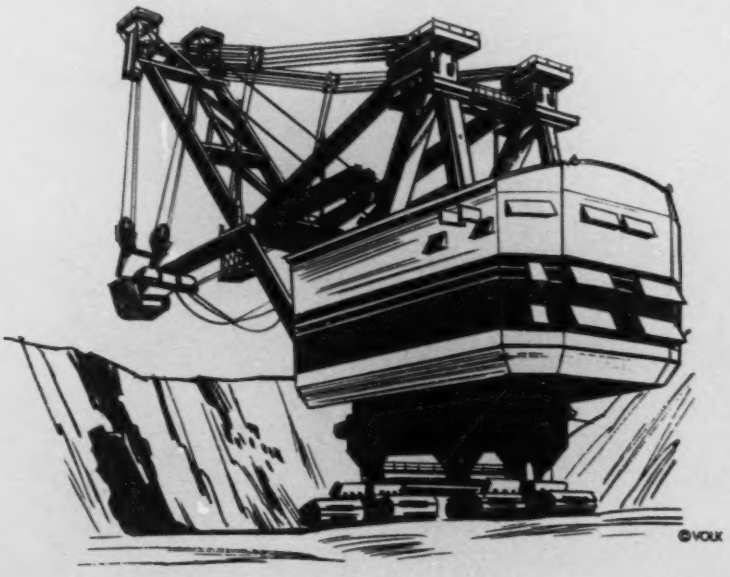
	Employment 1981	Job Openings* 1981-1985
Supervisors, Nonworking	1,846	201
Truck Drivers	1,438	103
Trades Helpers	1,435	158
Blasters	1,296	66
Heavy Equipment Operators	1,123	95
Welders & Flamecutters	825	92
Electricians	813	77
Managers & Officers	735	102
Mechanics, Maintenance	624	56
Mechanics, Mine-Machinery	580	52
Loading-Machine Operators, Underground	485	53
Mill &/or Grinder Operators, Minerals	457	36
Science Technicians	404	34
Mechanics, Diesel	386	33
Geologists & Geophysicists	384	31
Mechanics, Automotive	359	29
Mechanics, Engineering-Equipment	348	28
Drillers, Machine	323	42
Secretaries	318	71
Oilers	264	32
Stock Clerks	263	29
Cement Masons	237	16
General Clerks	225	47
Crane, Derrick & Hoist Operators	209	20
Conveyor Operators/Tenders	204	23
Accountants & Auditors	191	27
Personnel & Labor Relations Specialists	188	22
Brakers, Train	187	19
Plumbers & Pipefitters	182	18
Machinists	179	18
Mining Engineers	178	26
Panelboard Operators	158	18
Carpenters	157	20
Guards & Doorkeepers	155	9
Yard Engineers	152	32

*Does not include turnover

The distribution of workers by major occupational category has not changed significantly since 1978. Based on the data, maintenance and production workers appear to have lost some of their share of total industry employment to professional, technical, managerial, and clerical personnel. Although not conspicuous at this time, this trend should prevail in the long term.

Because little employment growth is expected in the 1981-1985 period, most job opportunities in mining will result from employees leaving the labor force or changing jobs. Projected job openings (excluding turnover) reflect a pattern similar but not identical to the current occupational structure. Approximately 70 percent of the job openings in the industry will transpire in maintenance and production occupations. Clerical workers, with 6.5 percent of the industry's employment, will provide more than 10 percent of the job opportunities. If openings resulting from turnover were included, the clerical workers category would further increase its share of job openings, as these workers generally have a higher turnover rate.

Supervisors, trades helpers, truck drivers, and mechanics will see the greatest number of job opportunities in the maintenance and production occupations, while secretaries, general office clerks, and file clerks are expected to lead the clerical openings. In the professional class, relatively strong demand will continue for engineers. As the supply of high-grade ores diminishes, engineers will be required to develop new ways of recycling solid waste materials and processing low-grade ores now regarded as unprofitable to mine. More technologically-advanced mining systems and further enforcement of mine health and safety regulations will also increase the need for engineers and technical personnel.



OCCUPATIONAL STRUCTURE

The following thirteen tables provide employment estimates and projected employment and job openings for the counties and the state. Graham and Greenlee counties have been combined due to their close proximity, similar economies, and size.

When using the data, please note the following:

1) The data reflect full and part-time wage and salary employment only, and do not include self-employed or unpaid family workers.

2) Total job openings represent the number of openings due to growth of the industry and separations from the labor force. They do not account for labor turnover, i.e., openings created when a worker changes jobs, leaving the job to be filled by someone else. These vacancies are often the largest source of job openings.

3) The projection technique does not possess the degree of accuracy that may be implied by small employment and demand figures.

4) To eliminate the possible disclosure of confidential employer information, occupations have been added to the appropriate "all other" or residual category if: less than three firms reported a single occupation; one firm reported more than 50 percent of the occupational estimate; two firms combined reported more than 75 percent of the occupational estimate. In certain cases, releases have been obtained from large employers to waive the confidentiality criteria.

5) Mining employment in Apache, Coconino, Santa Cruz, and Yuma counties is relatively insignificant; therefore, tables for these counties are excluded. Data for these counties are included in the statewide table, however.

ESTIMATED EMPLOYMENT AND JOB OPENINGS
MINING

STATEWIDE

	Estimated 1981 Employment	Percent of Total 1981 Employment	Projected 1985 Employment	Total Job Openings 1981-1985
TOTAL MANAGERS & OFFICERS	735	3.0	727	102
TOTAL PROFESSIONAL WORKERS	1,724	7.0	1,683	171
Chemical Engineers	20	.1	21	1
Civil Engineers	30	.1	29	4
Industrial Engineers	31	.1	31	2
Mechanical Engineers	53	.2	53	3
Metal Engineers	143	.6	142	7
Mining Engineers	178	.7	172	26
Safety Engineers	61	.2	60	5
All Other Engineers	86	.3	83	5
Chemists	133	.5	131	15
Geologists & Geophysicists	384	1.5	381	31
All Other Natural & Math Scientists	6	.0	6	1
Systems Analysts, EDP	59	.2	58	3
Purchasing Agents &/or Buyers	83	.3	81	10
Accountants & Auditors	191	.8	188	27
Personnel & Labor Relations Specialists	188	.8	186	22
All Other Professional Workers	78	.3	61	9
TOTAL TECHNICAL WORKERS	917	3.7	906	77
Computer Programmers	49	.2	49	3
Drafters	139	.5	137	11
Surveyors	80	.3	79	5
Mechanical Engineering Technicians	13	.0	13	0
Civil Engineering Technicians	8	.0	8	1
All Other Engineering Technicians	99	.4	97	10
Science Technicians	404	1.6	399	34
All Other Technical Workers	125	.5	124	13
TOTAL SERVICE WORKERS	349	1.4	344	43
Janitors, Porters & Cleaners	107	.4	106	19
Guards & Doorkeepers	155	.6	152	9
Food Service Workers	41	.2	40	7
Supervisors, Nonworking-Service	10	.0	10	1
All Other Service Workers	36	.1	36	7
TOTAL MAINTENANCE & PRODUCTION WORKERS	19,432	78.4	19,230	1,917
Mechanics, Automotive	359	1.4	353	29
Mechanics, Diesel	386	1.6	385	33
Mechanics, Engineering-Equipment	348	1.4	344	28
Mechanics, Mine-Machinery	580	2.3	579	52
Mechanics, Maintenance	624	2.5	619	56
All Other Mechanics & Repairers	217	.9	215	19
Truck Drivers	1,438	5.8	1,423	103
Blasters	1,296	5.2	1,272	66
Headers, Bottomers, Car Droppers &/or Cagers	51	.2	50	7
Brakers, Train	187	.8	183	19
Carpenters	157	.6	154	20
Cement Masons	237	1.0	232	16
Crane, Derrick & Hoist Operators	209	.8	205	20
Delivery & Route Workers	20	.1	20	1
Dispatchers, Mine-Car	25	.1	25	2
Drier Operators, Coal or Ore	25	.1	25	3
Drillers, Hand	30	.1	31	4
Drillers, Machine	323	1.3	320	42
Dump Operators	27	.1	27	4
Electricians	813	3.3	807	77
Supervisors, Nonworking	1,846	7.5	1,832	201
Heavy Equipment Operators	1,123	4.5	1,119	95
Riggers	19	.1	19	2
Industrial Truck Operators	52	.2	51	4
Lampkeepers/Repairers	12	.0	12	1

ESTIMATED EMPLOYMENT AND JOB OPENINGS
MINING

STATEWIDE (CONTD.)

	Estimated 1981 Employment	Percent of Total 1981 Employment	Projected 1985 Employment	Total Job Openings 1981-1985
Loading-Machine Operators, Underground	485	2.0	478	53
Machinists	179	.7	177	18
Maintenance Repairers, General Utility	147	.6	146	14
Trades Helpers	1,435	5.8	1,419	158
Millwrights	44	.2	44	6
Dinkey Operators	4	.0	4	1
Oilers	264	1.1	266	32
Painters, Maintenance	99	.4	98	12
Panelboard Operators	158	.6	156	18
Plumbers &/or Pipefitters	182	.7	179	18
Reagent Tenders	68	.3	64	8
Sheet Metal Workers	10	.0	10	1
Shuttle-Car Operators	60	.2	59	7
Stationary Boiler Firers	5	.0	5	1
Stationary Engineers	35	.1	35	4
Welders & Flamecutters	825	3.3	817	92
Surveyor Helpers	47	.2	47	5
Belt Repairers	23	.1	23	3
Samplers &/or Test Preparers	122	.5	121	13
Separator Tenders	25	.1	25	2
Conveyor Operators/Tenders	204	.8	201	23
Yard Engineers	152	.6	150	32
Mill &/or Grinder Operators, Minerals	457	1.8	453	36
Pump Operators	53	.2	53	7
Mixers &/or Blenders, Chemicals	17	.1	17	2
All Other Skilled Craft Workers	301	1.2	295	30
All Other Operatives & Semiskilled Workers	747	3.0	738	85
All Other Laborers & Unskilled Workers	2,880	11.6	2,848	332
TOTAL CLERICAL WORKERS	1,607	6.5	1,587	297
Bookkeeping &/or Billing Machine Operators	1	.0	1	0
Computer Operators	40	.2	40	4
Keypunch Operators	42	.2	41	9
Accounting Clerks	117	.5	116	22
Bookkeepers, Hand	21	.1	21	4
Cashiers	6	.0	6	1
File Clerks	117	.5	116	31
General Clerks, Office	225	.9	224	47
Mail Clerks	3	.0	3	1
Order Clerks	29	.1	29	6
Payroll &/or Timekeeping Clerks	54	.2	54	10
Personnel Clerks	47	.2	46	13
Receptionists	10	.0	10	3
Secretaries	318	1.3	314	71
Switchboard Operators	9	.0	9	2
Switchboard Operators-Receptionists	19	.1	19	5
Typists	51	.2	50	12
Clerical Supervisors	39	.2	39	5
All Other Office Clerical Workers	41	.2	34	8
Production Clerks &/or Coordinators	59	.2	59	6
Shipping &/or Receiving Clerks	42	.2	41	4
Weighers, Record-Keeping	38	.2	37	4
Stock Clerks	263	1.1	263	29
All Other Plant Clerical Workers	16	.1	15	0
TOTAL SALES WORKERS	12	.0	12	2
TOTAL ALL OCCUPATIONS	24,776	100.0	24,489	2,609

ESTIMATED EMPLOYMENT AND JOB OPENINGS
MINING

STATEWIDE (CONTD.)

Confidential data for certain occupations have been added to "All" or "All Other" categories or collapsed into major occupational classes as follows:

PROFESSIONAL WORKERS

All Other Engineers
Petroleum Engineers

All Other Professional Workers
Lawyers
Lease Buyers

CLERICAL WORKERS

All Other Office Clerical Workers
Stenographers

All Other Plant Clerical Workers
Shipping Packers
Dispatchers

MAINTENANCE & PRODUCTION WORKERS

All Other Skilled Craft Workers
Cable Drillers
Dredge Operators
Fire Bosses
Rock Splitters, Quarry
Rotary-Drill Operators
Shooters &/or Seismograph Shooters

All Other Operatives & Semiskilled Workers
Inspectors
Shaker Tenders
Rotary-Drill Operator Helpers
Tipple Operators

All Other Laborers & Unskilled Workers
Production Packagers
Track Layers

SALES WORKERS

Sales Reps., Agents &/or Associates
Sales Clerks (Exc. Cashiers)

ESTIMATED EMPLOYMENT AND JOB OPENINGS
MINING

COCHISE COUNTY

	Estimated 1981 Employment	Projected 1985 Employment	Job Openings Due to Growth 1981-1985	Job Openings Due to Separations 1981-1985	Total Job Openings 1981-1985
TOTAL MANAGERS & OFFICERS	26	9	0	3	3
TOTAL PROFESSIONAL WORKERS	112	37	0	11	11
Civil Engineers	1	0	0	0	0
Mechanical Engineers	4	1	0	0	0
Metal Engineers	1	0	0	0	0
Mining Engineers	12	4	0	1	1
All Other Engineers	8	6	0	1	1
Chemists	3	1	0	0	0
Geologists & Geophysicists	12	4	0	1	1
Systems Analysts, EDP	3	1	0	0	0
Purchasing Agents &/or Buyers	17	5	0	2	2
Accountants & Auditors	27	8	0	3	3
Personnel & Labor Relations Specialists	1	0	0	0	0
All Other Professional Workers	23	7	0	3	3
TOTAL TECHNICAL WORKERS	55	17	0	3	3
Computer Programmers	4	1	0	0	0
Drafters	13	4	0	1	1
Surveyors	3	1	0	0	0
Civil Engineering Technicians	1	0	0	0	0
All Other Engineering Technicians	5	2	0	0	0
Science Technicians	29	9	0	2	2
TOTAL SERVICE WORKERS	22	7	0	3	3
Janitors, Porters & Cleaners	5	2	0	1	1
Supervisors, Nonworking-Service	1	0	0	0	0
All Other Service Workers	16	5	0	2	2
TOTAL MAINTENANCE & PRODUCTION WORKERS	97	32	0	7	7
Mechanics, Maintenance	1	0	0	0	0
All Other Mechanics & Repairers	1	0	0	0	0
Truck Drivers	10	3	0	1	1
Heavy Equipment Operators	21	6	0	1	1
Maintenance Repairers, General Utility	1	0	0	0	0
Reagent Tenders	5	2	0	0	0
Welders & Flamecutters	15	5	0	1	1
All Other Skilled Craft Workers	16	7	0	2	2
All Other Operatives & Semiskilled Workers	3	1	0	0	0
All Other Laborers & Unskilled Workers	24	8	0	2	2
TOTAL CLERICAL WORKERS	81	24	0	15	15
Computer Operators	3	1	0	0	0
Keypunch Operators	3	1	0	1	1
Stenographers	9	3	0	2	2
Accounting Clerks	13	4	0	2	2
File Clerks	1	0	0	0	0
Secretaries	14	4	0	3	3
Switchboard Operators-Receptionists	1	0	0	0	0
Typists	19	6	0	4	4
Clerical Supervisors	7	2	0	1	1
All Other Office Clerical Workers	10	3	0	2	2
All Plant Clerical Workers	1	0	0	0	0
TOTAL ALL OCCUPATIONS	393	126	0	42	42

ESTIMATED EMPLOYMENT AND JOB OPENINGS
MINING

COCHISE COUNTY (CONTD.)

Confidential data for certain occupations have been added to "All" or "All Other" categories or collapsed into major occupational classes as follows:

PROFESSIONAL WORKERS

All Other Engineers
Petroleum Engineers

MAINTENANCE & PRODUCTION WORKERS

All Other Skilled Craft Workers
Blasters
Carpenters
Drillers, Machine
Electricians
Supervisors, Nonworking
Rotary-Drill Operators

CLERICAL WORKERS

All Other Office Clerical Workers
Personnel Clerks

SERVICE WORKERS

All Other Service Workers
Guards & Doorkeepers

ESTIMATED EMPLOYMENT AND JOB OPENINGS
MINING

GILA COUNTY

	Estimated 1981 Employment	Projected 1985 Employment	Job Openings Due to Growth 1981-1985	Job Openings Due to Separations 1981-1985	Total Job Openings 1981-1985
TOTAL MANAGERS & OFFICERS	91	89	0	13	13
TOTAL TECHNICAL WORKERS	267	264	0	28	28
Metal Engineers	21	21	0	1	1
Mining Engineers	26	25	0	4	4
All Other Engineers	51	51	0	3	3
Chemists	52	51	0	6	6
Geologists & Geophysicists	20	20	0	2	2
Purchasing Agents &/or Buyers	12	12	0	2	2
Accountants & Auditors	42	41	0	4	4
All Other Professional Workers	43	43	0	4	4
TOTAL TECHNICAL WORKERS	94	93	0	8	8
Drafters	10	10	0	1	1
All Other Engineering Technicians	24	24	0	2	2
Science Technicians	57	56	0	5	5
All Other Technicians	3	3	0	0	0
TOTAL SERVICE WORKERS	32	32	0	4	4
TOTAL MAINTENANCE & PRODUCTION WORKERS	2,203	2,162	0	209	209
Mechanics, Automotive	164	151	0	13	13
Truck Drivers	242	237	0	17	17
Carpenters	27	26	0	3	3
Electricians	87	85	0	8	8
Supervisors, Nonworking	326	320	0	35	35
Heavy Equipment Operators	112	110	0	9	9
Trades Helpers	61	60	0	7	7
Oilers	8	8	0	1	1
Plumbers &/or Pipefitters	54	53	0	5	5
Welders & Flamecutters	97	95	0	11	11
Mill &/or Grinder Operators, Minerals	67	66	0	5	5
All Other Skilled Craft Workers	384	378	0	34	34
All Other Operatives & Semiskilled Workers	286	281	0	30	30
All Other Laborers & Unskilled Workers	288	282	0	31	31
TOTAL CLERICAL WORKERS	212	209	0	39	39
All Office Machine Operators	13	13	0	2	2
Accounting Clerks	15	15	0	3	3
General Clerks, Office	52	51	0	11	11
Payroll &/or Timekeeping Clerks	12	12	0	2	2
Secretaries	28	27	0	6	6
Switchboard Operators-Receptionists	6	6	0	2	2
All Other Office Clerical Workers	34	34	0	7	7
Stock Clerks	36	35	0	4	4
All Other Plant Clerical Workers	16	16	0	2	2
TOTAL SALES WORKERS	4	4	0	0	0
TOTAL ALL OCCUPATIONS	2,903	2,853	0	301	301

Confidential data for certain occupations have been added to "All" or "All Other" categories or collapsed into major occupational classes as follows:

PROFESSIONAL WORKERS

All Other Engineers
- Civil Engineers
- Industrial Engineers
- Mechanical Engineers
- Safety Engineers

PROFESSIONAL WORKERS (CONTD.)

All Other Professional Workers
- Systems Analysts, EDP
- Personnel & Labor Relations Specialists

ESTIMATED EMPLOYMENT AND JOB OPENINGS
MINING

GILA COUNTY (CONTD.)

TECHNICAL WORKERS

All Other Engineering Technicians
Computer Programmers
Surveyors

SERVICE WORKERS

All Other Service Workers
Janitors, Porters & Cleaners
Guards & Doorkeepers

MAINTENANCE & PRODUCTION WORKERS

All Other Skilled Craft Workers
Mechanics, Diesel
Mechanics, Engineering-Equipment
Mechanics, Mine-Machinery
Mechanics, Maintenance
Blasters
Brakers, Train
Cement Masons
Dispatchers, Mine-Car
Drillers, Hand
Drillers, Machine
Fire Bosses
Riggers
Machinists
Reagent Tenders
Sheet Metal Workers
Yard Engineers

MAINTENANCE & PRODUCTION WORKERS (CONTD.)

All Other Operatives & Semiskilled Workers
Crane, Derrick & Hoist Operators
Delivery & Route Workers
Industrial Truck Operators
Shuttle-Car Operators

Surveyor Helpers
Pump Operators

All Other Laborers & Unskilled Workers
Painters, Maintenance
Samplers &/or Test Preparers

CLERICAL WORKERS

All Other Office Machine Operators
Computer Operators
Keypunch Operators

All Other Clerical Workers
Personnel Clerks
Typists
Clerical Supervisors

All Other Plant Clerical Workers
Production Clerks &/or Coordinators
Shipping &/or Receiving Clerks
Weighers, Record-Keeping

ESTIMATED EMPLOYMENT AND JOB OPENINGS
MINING

GRAHAM AND GREENLEE COUNTIES

	Estimated 1981 Employment	Projected 1985 Employment	Job Openings Due to Growth 1981-1985	Job Openings Due to Separations 1981-1985	Total Job Openings 1981-1985
TOTAL MANAGERS & OFFICERS	36	35	0	5	5
TOTAL PROFESSIONAL WORKERS	74	74	0	7	7
Civil Engineers	10	10	0	1	1
Industrial Engineers	1	1	0	0	0
Mechanical Engineers	1	1	0	0	0
Metal Engineers	5	5	0	0	0
Mining Engineers	10	10	0	1	1
All Other Engineers	3	3	0	0	0
Chemists	18	18	0	2	2
Geologists & Geophysicists	9	9	0	1	1
Systems Analysts, EDP	3	3	0	0	0
Purchasing Agents &/or Buyers	2	2	0	0	0
Accountants & Auditors	4	4	0	1	1
Personnel & Labor Relations Specialists	7	7	0	1	1
All Other Professional Workers	1	1	0	0	0
TOTAL TECHNICAL WORKERS	40	40	0	2	2
Computer Programmers	5	5	0	0	0
Drafters	16	16	0	1	1
Surveyors	7	7	0	0	0
Civil Engineering Technicians	2	2	0	0	0
All Other Engineering Technicians	4	4	0	0	0
Science Technicians	1	1	0	0	0
All Other Technicians	5	5	0	1	1
TOTAL SERVICE WORKERS	57	56	0	6	6
Janitors, Porters & Cleaners	29	28	0	5	5
Guards & Doorkeepers	28	28	0	1	1
TOTAL MAINTENANCE & PRODUCTION WORKERS	2,343	2,299	0	249	249
Mechanics, Automotive	15	15	0	1	1
Mechanics, Diesel	14	14	0	0	0
Mechanics, Engineering - Equipment	18	18	0	1	1
Mechanics, Mine-Machinery	43	42	0	4	4
Mechanics, Maintenance	30	29	0	2	2
All Other Mechanics & Repairers	62	61	0	6	6
Truck Drivers	88	86	0	6	6
Blasters	17	17	0	1	1
Headers, Bottomers, Car Droppers &/or Cagers	6	6	0	1	1
Carpenters	35	34	0	4	4
Cement Masons	3	3	0	0	0
Crane, Derrick & Hoist Operators	32	31	0	3	3
Dispatchers, Mine-Car	14	14	0	1	1
Drier Operators, Coal or Ore	9	9	0	1	1
Electricians	112	110	0	10	10
Supervisors, Nonworking	274	269	0	30	30
Loading-Machine Operators, Underground	59	58	0	7	7
Machinists	29	28	0	3	3
Maintenance Repairers, General Utility	71	70	0	6	6
Millwrights	29	28	0	4	4
Dinkey Operators	2	2	0	0	0
Oilers	19	19	0	2	2
Painters, Maintenance	40	39	0	5	5
Plumbers &/or Pipefitters	29	28	0	3	3
Sheet Metal Workers	5	5	0	0	0
Stationary Boiler Firers	2	2	0	0	0
Stationary Engineers	12	12	0	1	1
Track Layers	125	123	0	14	14
Welders & Flamecutters	65	64	0	8	8
Surveyor Helpers	6	6	0	1	1
Sampler &/or Test Preparers	5	5	0	1	1
Conveyor Operators/Tenders	34	33	0	4	4

ESTIMATED EMPLOYMENT AND JOB OPENINGS
MINING

GRAHAM AND GREENLEE COUNTIES (CONTD.)

	Estimated 1981 Employment	Projected 1985 Employment	Job Openings Due to Growth 1981-1985	Job Openings Due to Separations 1981-1985	Total Job Openings 1981-1985
Yard Engineers	96	94	0	20	20
Mill &/or Grinder Operators Minerals	56	55	0	4	4
Pump Operators	10	10	0	1	1
All Other Skilled Craft Workers	32	32	0	4	4
All Other Operatives & Semiskilled Workers	105	103	0	8	8
All Other Laborers & Unskilled Workers	740	725	0	82	82
TOTAL CLERICAL WORKERS	207	205	0	43	43
Bookkeeping &/or Billing Machine Operators	1	1	0	0	0
Computer Operators	3	3	0	0	0
Keypunch Operators	2	2	0	0	0
Accounting Clerks	7	7	0	1	1
Bookkeepers, Hand	1	1	0	0	0
Cashiers	1	1	0	0	0
File Clerks	74	73	0	20	20
General Clerks, Office	5	5	0	1	1
Mail Clerks	1	1	0	0	0
Payroll &/or Timekeeping Clerks	6	6	0	1	1
Personnel Clerks	3	3	0	1	1
Receptionists	3	3	0	1	1
Secretaries	59	58	0	13	13
Switchboard Operators	1	1	0	0	0
Clerical Supervisors	5	5	0	1	1
Production Clerks &/or Coordinators	17	17	0	2	2
Shipping Packers	2	2	0	0	0
Shipping &/or Receiving Clerks	2	2	0	0	0
Stock Clerks	6	6	0	1	1
Dispatchers	8	8	0	1	1
TOTAL ALL OCCUPATIONS	2,757	2,709	0	312	312

Confidential data for certain occupations have been added to "All" or "All Other" categories or collapsed into major occupational classes as follows:

MAINTENANCE & PRODUCTION WORKERS

All Other Skilled Craft Workers
Drillers, Machine

All Other Operatives and Semiskilled Workers
Heavy Equipment Operators

All Other Laborers and Unskilled Workers
Trades Helpers

ESTIMATED EMPLOYMENT AND JOB OPENINGS
MINING

MARICOPA COUNTY

	Estimated 1981 Employment	Projected 1985 Employment	Job Openings Due to Growth 1981-1985	Job Openings Due to Separations 1981-1985	Total Job Openings 1981-1985
TOTAL MANAGERS & OFFICERS	69	80	11	12	23
TOTAL PROFESSIONAL WORKERS	79	126	48	10	58
All Engineers	22	30	8	3	11
Geologists & Geophysicists	23	22	0	2	2
All Other Professional Workers	34	74	40	5	45
TOTAL TECHNICAL WORKERS	14	49	35	4	39
TOTAL SERVICE WORKERS	10	23	13	3	16
TOTAL MAINTENANCE & PRODUCTION WORKERS	172	167	0	18	18
All Mechanics & Repairers	8	8	0	1	1
Heavy Equipment Operators	52	50	0	4	4
Loading-Machine Operators, Underground	23	22	0	3	3
All Skilled Trades Helpers	14	13	0	2	2
All Skilled Craft Workers	56	55	0	6	6
All Other Operatives & Semiskilled Workers	19	19	0	2	2
TOTAL CLERICAL WORKERS	84	123	39	25	64
All Office Machine Operators	3	7	4	1	5
General Clerks, Office	12	12	0	3	3
Secretaries	33	41	8	9	17
All Other Office Clerical Workers	22	49	27	11	38
Weighers	13	13	0	1	1
All Other Plant Clerical Workers	1	1	0	0	0
TOTAL ALL OCCUPATIONS	428	568	146	72	218

Confidential data for certain occupations have been added to "All" or "All Other" categories or collapsed into major occupational classes as follows:

PROFESSIONAL WORKERS

All Engineers
- Mechanical Engineers
- Mining Engineers
- Petroleum Engineers

All Other Professional Workers
- Systems Analysts, EDP
- Purchasing Agents &/or Buyers
- Accountants & Auditors
- Lawyers
- Lease Buyers
- Personnel & Labor Relations Specialists

TECHNICAL WORKERS

- Computer Programmers
- Drafters

SERVICE WORKERS

- Janitors, Porters & Cleaners
- Supervisors, Nonworking-Service

MAINTENANCE & PRODUCTION WORKERS

All Mechanics & Repairers
- Mechanics, Maintenance

All Skilled Craft Workers
- Cable Drillers
- Supervisors, Nonworking
- Riggers
- Maintenance Repairers, General Utility
- Panelboard Operators
- Rotary-Drill Operators
- Shooters &/or Seismograph Shooters
- Welders & Flamecutters

CLERICAL WORKERS

All Other Office Clerical Workers
- Accounting Clerks
- Bookkeepers, Hand
- Payroll &/or Timekeeping Clerks

ESTIMATED EMPLOYMENT AND JOB OPENINGS
MINING

MOHAVE COUNTY

	Estimated 1981 Employment	Projected 1985 Employment	Job Openings Due to Growth 1981-1985	Job Openings Due to Separations 1981-1985	Total Job Openings 1981-1985
TOTAL MANAGERS & OFFICERS	20	20	0	3	3
TOTAL PROFESSIONAL WORKERS	68	67	0	4	4
Chemical Engineers	1	1	0	0	0
Industrial Engineers	1	1	0	0	0
Mechanical Engineers	2	2	0	0	0
Metal Engineers	1	1	0	0	0
Mining Engineers	2	2	0	0	0
Safety Engineers	2	2	0	0	0
All Other Engineers	2	2	0	0	0
Chemists	1	1	0	0	0
Geologists & Geophysicists	51	50	0	4	4
Purchasing Agents &/or Buyers	1	1	0	0	0
Accountants & Auditors	2	2	0	0	0
Personnel & Labor Relations Specialists	2	2	0	0	0
TOTAL TECHNICAL WORKERS	20	20	0	2	2
Computer Programmers	1	1	0	0	0
Drafters	2	2	0	0	0
Surveyors	1	1	0	0	0
All Other Engineering Technicians	6	6	0	1	1
All Other Technicians	10	10	0	1	1
TOTAL SERVICE WORKERS	24	24	0	1	1
Janitors, Porters & Cleaners	2	2	0	0	0
Guards & Doorkeepers	22	22	0	1	1
TOTAL MAINTENANCE & PRODUCTION WORKERS	443	435	0	41	41
Mechanics, Automotive	3	3	0	0	0
Mechanics, Diesel	12	12	0	1	1
Mechanics, Engineering-Equipment	5	5	0	0	0
Mechanics, Mine-Machinery	6	6	0	1	1
Mechanics, Maintenance	35	34	0	3	3
All Other Mechanics & Repairers	5	5	0	0	0
Truck Drivers	32	31	0	2	2
Carpenters	1	1	0	0	0
Drillers, Machine	5	5	0	1	1
Dump Operators	2	2	0	0	0
Electricans	19	19	0	2	2
Supervisors, Nonworking	43	42	0	5	5
Heavy Equipment Operators	21	21	0	2	2
Industrial Truck Operators	2	2	0	0	0
Machinists	3	3	0	0	0
Trades Helpers	29	28	0	3	3
Oilers	10	10	0	1	1
Painters, Maintenance	3	3	0	0	0
Panelboard Operators	2	2	0	0	0
Plumbers &/or Pipefitters	3	3	0	0	0
Production Packagers, Hand or Machine	1	1	0	0	0
Reagent Tenders	3	3	0	0	0
Welders & Flamecutters	37	36	0	4	4
Samplers &/or Test Preparers	3	3	0	0	0
Mill &/or Grinder Operators, Minerals	39	38	0	3	3
Pump Operators	3	3	0	0	0
All Other Skilled Craft Workers	15	15	0	1	1
All Other Operatives & Semiskilled Workers	22	22	0	3	3
All Other Laborers & Unskilled Workers	79	77	0	9	9
TOTAL CLERICAL WORKERS	24	24	0	3	3
Computer Operators	1	1	0	0	0
Keypunch Operators	1	1	0	0	0
Accounting Clerks	2	2	0	0	0

ESTIMATED EMPLOYMENT AND JOB OPENINGS
MINING

MOHAVE COUNTY (CONTD.)

	Estimated 1981 Employment	Projected 1985 Employment	Job Openings Due to Growth 1981-1985	Job Openings Due to Separations 1981-1985	Total Job Openings 1981-1985
General Clerks, Office	6	6	0	1	1
Order Clerks	1	1	0	0	0
Payroll &/or Timekeeping Clerks	1	1	0	0	0
Personnel Clerks	2	2	0	1	1
Secretaries	1	1	0	0	0
Switchboard Operators-Receptionists	1	1	0	0	0
Production Clerks &/or Coordinators	1	1	0	0	0
Shipping &/or Receiving Clerks	1	1	0	0	0
Stock Clerks	6	6	0	1	1
TOTAL ALL OCCUPATIONS	599	590	0	54	54

Confidential data for certain occupations have been added to "All" or "All Other" categories or collapsed into major occupational classes as follows:

MAINTENANCE & PRODUCTION WORKERS

All Other Skilled Craft Workers
Blasters

All Other Operatives & Semiskilled Workers
Crane, Derrick & Hoist Operators
Conveyor Operators/Tenders

ESTIMATED EMPLOYMENT AND JOB OPENINGS
MINING

NAVAJO COUNTY

	Estimated 1981 Employment	Projected 1985 Employment	Job Openings Due to Growth 1981-1985	Job Openings Due to Separations 1981-1985	Total Job Openings 1981-1985
TOTAL MANAGERS & OFFICERS	32	34	2	5	7
TOTAL PROFESSIONAL WORKERS	32	34	2	3	5
All Engineers	9	9	0	1	1
All Natural & Math Scientists	3	3	0	0	0
All Other Professional Workers	20	22	2	2	4
TOTAL TECHNICAL WORKERS	26	28	2	2	4
All Engineering Technicians	13	14	1	1	2
All Other Technicians	13	14	1	1	2
TOTAL SERVICE WORKERS	10	10	0	2	2
TOTAL MAINTENANCE & PRODUCTION WORKERS	933	991	58	93	151
All Mechanics & Repairers	86	91	5	8	13
Truck Drivers	19	20	1	1	2
Supervisors, Nonworking	103	110	7	11	18
All Other Skilled Craft Workers	158	168	10	14	24
All Other Operatives & Semiskilled Workers	393	417	24	39	63
All Other Laborers & Unskilled Workers	174	185	11	20	31
TOTAL CLERICAL WORKERS	77	82	5	12	17
All Office Clerical Workers	35	37	2	7	9
All Plant Clerical Workers	42	45	3	5	8
TOTAL ALL OCCUPATIONS	1,110	1,179	69	117	186

Confidential data for certain occupations have been added to "All" or "All Other" categories or collapsed into major occupational classes as follows:

PROFESSIONAL WORKERS

All Engineers
- Mining Engineers
- Safety Engineers

All Other Professional Workers
- Systems Analysts, EDP
- Purchasing Agents &/or Buyers
- Accountants & Auditors
- Personnel & Labor Relations Specialists

TECHNICAL WORKERS

All Engineering Technicians
- Surveyors

All Other Technicians
- Science Technicians

SERVICE WORKERS

- Janitors, Porters & Cleaners

MAINTENANCE & PRODUCTION WORKERS

All Mechanics & Repairers
- Mechanics, Diesel
- Mechanics, Engineering-Equipment
- Mechanics, Mine-Machinery

All Other Skilled Craft Workers
- Blasters
- Drillers, Machine
- Electricians
- Riggers
- Machinists
- Maintenance Repairers, General Utility
- Rock Splitters, Quarry
- Stationary Engineers

MAINTENANCE & PRODUCTION WORKERS (CONTD.)

All Other Operatives & Semiskilled Workers
- Delivery & Route Workers
- Heavy Equipment Operators
- Inspectors
- Loading-Machine Operators, Underground
- Tipple Operators
- Welders & Flamecutters
- Surveyor Helpers
- Conveyor Operators/Tenders
- Pump Operators

All Other Laborers & Unskilled Workers
- Trades Helpers
- Oilers

CLERICAL WORKERS

All Office Clerical Workers
- Computer Operators
- Accounting Clerks
- Bookkeepers, Hand
- General Clerks, Office
- Mail Clerks

ESTIMATED EMPLOYMENT AND JOB OPENINGS
MINING

NAVAJO COUNTY (CONTD.)

CLERICAL WORKERS (CONTD.)

Payroll &/or Timekeeping Clerks
Personnel Clerks
Secretaries
Typists
Clerical Supervisors

All Plant Clerical Workers
Production Clerks &/or Coordinators
Weighers, Record-Keeping
Stock Clerks

ESTIMATED EMPLOYMENT AND JOB OPENINGS
MINING

PIMA COUNTY

	Estimated 1981 Employment	Projected 1985 Employment	Job Openings Due to Growth 1981-1985	Job Openings Due to Separations 1981-1985	Total Job Openings 1981-1985
TOTAL MANAGERS & OFFICERS	271	273	2	38	40
TOTAL PROFESSIONAL WORKERS	590	591	1	55	56
Chemical Engineers	6	6	0	0	0
Civil Engineers	4	4	0	1	1
Industrial Engineers	21	21	0	2	2
Mechanical Engineers	30	30	0	2	2
Metal Engineers	67	67	0	3	3
Mining Engineers	64	64	0	9	9
Safety Engineers	24	24	0	2	2
All Other Engineers	6	6	0	0	0
Chemists	42	42	0	5	5
Geologists & Geophysicists	201	202	1	16	17
All Other Natural & Math Scientists	4	4	0	0	0
Systems Analysts, EDP	15	15	0	1	1
Purchasing Agents &/or Buyers	23	23	0	3	3
Accountants & Auditors	49	49	0	7	7
Personnel & Labor Relations Specialists	25	25	0	3	3
All Other Professional Workers	9	9	0	1	1
TOTAL TECHNICAL WORKERS	294	295	1	25	26
Computer Programmers	22	22	0	1	1
Drafters	48	48	0	4	4
Surveyors	15	15	0	1	1
All Other Engineering Technicians	56	56	0	6	6
Science Technicians	121	122	1	10	11
All Other Technicians	32	32	0	3	3
TOTAL SERVICE WORKERS	76	76	0	9	9
Janitors, Porters & Cleaners	32	32	0	6	6
Guards & Doorkeepers	44	44	0	3	3
TOTAL MAINTENANCE & PRODUCTION WORKERS	6,042	6,075	33	609	642
Mechanics, Automotive	86	87	1	7	8
Mechanics, Diesel	236	237	1	20	21
Mechanics, Engineering-Equipment	123	124	1	10	11
Mechanics, Mine-Machinery	153	154	1	14	15
Mechanics, Maintenance	307	309	2	28	30
All Other Mechanics & Repairers	80	80	0	7	7
Truck Drivers	600	604	4	43	47
Blasters	19	19	0	1	1
Brakers, Train	1	1	0	0	0
Carpenters	37	37	0	5	5
Cement Masons	3	3	0	0	0
Crane, Derrick & Hoist Operators	21	21	0	2	2
Delivery & Route Workers	3	3	0	0	0
Dispatchers, Mine-Car	8	8	0	1	1
Drier Operators, Coal or Ore	4	4	0	1	1
Drillers, Machine	127	128	1	17	18
Electricians	282	284	2	27	29
Supervisors, Nonworking	644	648	4	70	74
Heavy Equipment Operators	321	323	2	27	29
Industrial Truck Operators	13	13	0	1	1
Loading-Machine Operators, Underground	64	64	0	7	7
Machinists	46	46	0	5	5
Maintenance Repairers, General Utility	54	54	0	5	5
Trades Helpers	529	532	3	59	62
Millwrights	15	15	0	2	2
Dinkey Operators	1	1	0	0	0
Oilers	148	149	1	16	17
Painters, Maintenance	43	43	0	5	5
Panelboard Operators	38	38	0	4	4
Plumbers &/or Pipefitters	40	40	0	4	4

ESTIMATED EMPLOYMENT AND JOB OPENINGS
MINING

PIMA COUNTY (CONTD.)

	Estimated 1981 Employment	Projected 1985 Employment	Job Openings Due to Growth 1981-1985	Job Openings Due to Separations 1981-1985	Total Job Openings 1981-1985
Production Packagers	15	15	0	2	2
Reagent Tenders	47	47	0	5	5
Sheet Metal Workers	3	3	0	0	0
Stationary Boiler Firers	1	1	0	0	0
Stationary Engineers	7	7	0	1	1
Track Layers	68	68	0	8	8
Welders & Flamecutters	368	370	2	41	43
Surveyor Helpers	10	10	0	1	1
Samplers &/or Test Preparers	39	39	0	4	4
Conveyor Operators/Tenders	18	18	0	2	2
Yard Engineers	52	52	0	11	11
Mill &/or Grinder Operators, Minerals	150	151	1	12	13
Pump Operators	26	26	0	3	3
All Other Skilled Craft Workers	57	57	0	5	5
All Other Operatives & Semiskilled Workers	190	191	1	21	22
All Other Laborers & Unskilled Workers	945	951	6	105	111
TOTAL CLERICAL WORKERS	494	497	3	91	94
Computer Operators	16	16	0	2	2
Keypunch Operators	12	12	0	3	3
Accounting Clerks	35	35	0	7	7
Bookkeepers, Hand	4	4	0	1	1
Cashiers	1	1	0	0	0
File Clerks	42	42	0	11	11
General Clerks, Office	91	92	1	19	20
Order Clerks	10	10	0	2	2
Payroll &/or Timekeeping Clerks	14	14	0	2	2
Personnel Clerks	20	20	0	5	5
Receptionists	3	3	0	1	1
Secretaries	95	96	1	21	22
Switchboard Operators	1	1	0	0	0
Switchboard Operators-Receptionists	9	9	0	2	2
Typists	9	9	0	2	2
Clerical Supervisors	3	3	0	0	0
All Other Office Clerical Workers	3	3	0	0	0
Production Clerks &/or Coordinators	17	17	0	2	2
Shipping Packers	1	1	0	0	0
Shipping &/or Receiving Clerks	3	3	0	0	0
Stock Clerks	101	102	1	11	12
Dispatchers	3	3	0	0	0
All Other Plant Clerical Workers	1	1	0	0	0
TOTAL ALL OCCUPATIONS	7,767	7,807	40	827	867

Confidential data for certain occupations have been added to "All" or "All Other" categories or collapsed into major occupational classes as follows:

PROFESSIONAL WORKERS

All Other Professional Workers
Lawyers
Lease Buyers

TECHNICAL WORKERS

All Other Engineering Technicians
Civil Engineering Technicians

MAINTENANCE & PRODUCTION WORKERS

All Other Skilled Craft Workers
Drillers, Hand

All Other Operatives & Semiskilled Workers
Shaker Tenders
Separator Tenders

All Other Laborers & Unskilled Workers
Dump Operators

ESTIMATED EMPLOYMENT AND JOB OPENINGS
MINING

PINAL COUNTY

	Estimated 1981 Employment	Projected 1985 Employment	Job Openings Due to Growth 1981-1985	Job Openings Due to Separations 1981-1985	Total Job Openings 1981-1985
TOTAL MANAGERS & OFFICERS	139	137	0	19	19
TOTAL PROFESSIONAL WORKERS	427	419	0	45	45
Chemical Engineers	13	13	0	1	1
Mechanical Engineers	6	6	0	0	0
Metal Engineers	42	41	0	2	2
Mining Engineers	45	44	0	7	7
Safety Engineers	24	24	0	2	2
All Other Engineers	32	31	0	2	2
Chemists	15	15	0	2	2
Geologists & Geophysicists	43	42	0	3	3
Systems Analysts, EDP	15	15	0	1	1
Purchasing Agents &/or Buyers	16	16	0	2	2
Accountants & Auditors	45	44	0	7	7
Personnel & Labor Relations Specialists	127	124	0	15	15
All Other Professional Workers	4	4	0	1	1
TOTAL TECHNICAL WORKERS	335	329	0	28	28
Computer Programmers	12	12	0	1	1
Drafters	33	32	0	3	3
Surveyors	37	36	0	2	2
Mechanical Engineering Technicians	13	13	0	0	0
All Other Engineering Technicians	7	7	0	1	1
Science Technicians	166	163	0	14	14
All Other Technical Workers	67	66	0	7	7
TOTAL SERVICE WORKERS	53	53	0	6	6
Janitors, Porters & Cleaners	13	13	0	2	2
Guards & Doorkeepers	29	29	0	2	2
All Other Service Workers	11	11	0	2	2
TOTAL MAINTENANCE & PRODUCTION WORKERS	6,447	6,331	0	560	560
Mechanics, Automotive	78	76	0	6	6
Mechanics, Diesel	72	71	0	6	6
Mechanics, Engineering-Equipment	126	123	0	10	10
Mechanics, Mine-Machinery	243	238	0	22	22
Mechanics, Maintenance	136	133	0	12	12
All Other Mechanics & Repairers	68	67	0	6	6
Truck Drivers	342	337	0	25	25
Blasters	1,215	1,191	0	62	62
Headers, Bottomers, Car Droppers &/or Cagers	45	44	0	6	6
Brakers, Train	171	168	0	18	18
Carpenters	47	46	0	6	6
Cement Masons	224	220	0	15	15
Crane, Derrick & Hoist Operators	124	122	0	12	12
Delivery & Route Workers	11	11	0	1	1
Drillers, Machine	66	65	0	9	9
Electricians	222	218	0	21	21
Supervisors, Nonworking	369	362	0	40	40
Heavy Equipment Operators	161	160	0	14	14
Industrial Truck Operators	34	33	0	2	2
Lampkeepers/Repairers	12	12	0	1	1
Loading-Machine Operators, Underground	324	318	0	36	36
Machinists	47	46	0	5	5
Trades Helpers	392	385	0	43	43
Panelboard Operators	109	107	0	12	12
Plumbers &/or Pipefitters	49	48	0	5	5
Shuttle-Car Operators	56	55	0	6	6
Welders & Flamecutters	103	101	0	11	11
Surveyor Helpers	23	23	0	3	3
Belt Repairers	23	23	0	3	3

ESTIMATED EMPLOYMENT AND JOB OPENINGS
MINING

PINAL COUNTY (CONTD.)

	Estimated 1981 Employment	Projected 1985 Employment	Job Openings Due to Growth 1981-1985	Job Openings Due to Separations 1981-1985	Total Job Openings 1981-1985
Samplers &/or Test Preparers	72	71	0	8	8
Conveyor Operators/Tenders	135	132	0	15	15
Mill &/or Grinder Operators, Minerals	128	126	0	10	10
Mixers &/or Blenders, Chemicals	11	11	0	1	1
All Other Skilled Craft Workers	121	120	0	12	12
All Other Operatives & Semiskilled Workers	298	292	0	9	9
All Other Laborers & Unskilled Workers	790	776	0	87	87
TOTAL CLERICAL WORKERS	319	315	0	57	57
Keypunch Operators	14	14	0	3	3
All Other Office Machine Operators	11	11	0	2	2
Accounting Clerks	25	25	0	5	5
General Clerks, Office	37	36	0	8	8
Order Clerks	18	18	0	4	4
Payroll &/or Timekeeping Clerks	13	13	0	2	2
Personnel Clerks	14	14	0	4	4
Secretaries	54	53	0	12	12
Switchboard Operators-Receptionists	5	5	0	1	1
Typists	10	10	0	3	3
Clerical Supervisors	14	14	0	2	2
All Other Office Clerical Workers	9	9	0	2	2
Shipping &/or Receiving Clerks	29	28	0	3	3
Weighers, Record-Keeping	20	20	0	2	2
Stock Clerks	46	45	0	5	5
TOTAL ALL OCCUPATIONS	7,720	7,584	0	738	738

Confidential data for certain occupations have been added to "All" or "All Other" categories or collapsed into major occupational classes as follows:

PROFESSIONAL & TECHNICAL WORKERS

All Other Engineers
Industrial Engineers

SERVICE WORKERS

All Other Service Workers
Food Service Workers
Supervisors, Nonworking-Service

MAINTENANCE & PRODUCTION WORKERS

All Other Skilled Craft Workers
Drillers, Hand
Riggers
Maintenance Repairers, General Utility
Rock Splitters, Quarry
Reagent Tenders
Stationary Engineers

MAINTENANCE & PRODUCTION WORKERS (CONTD.)

All Other Operatives & Semiskilled Workers
Drier Operators, Coal or Ore
Dinkey Operators
Stationary Boiler Firers
Separator Tenders

All Other Laborers & Unskilled Workers
Dump Operators
Oilers
Painters, Maintenance

CLERICAL WORKERS

All Other Office Machine Operators
Computer Programmers
Stenographers

All Other Office Clerical Workers
Receptionists
Switchboard Operators

ESTIMATED EMPLOYMENT AND JOB OPENINGS
MINING

YAVAPAI COUNTY

	Estimated 1981 Employment	Projected 1985 Employment	Job Openings Due to Growth 1981-1985	Job Openings Due to Separations 1981-1985	Total Job Openings 1981-1985
TOTAL MANAGERS & OFFICERS	44	43	0	6	6
TOTAL PROFESSIONAL WORKERS	69	69	0	8	8
Civil Engineers	5	5	0	1	6
Mining Engineers	11	11	0	2	2
All Other Engineers	6	6	0	0	0
Chemists	2	2	0	0	0
Geologists & Geophysicists	18	18	0	1	1
Purchasing Agents &/or Buyers	8	8	0	1	1
Accountants & Auditors	5	5	0	1	1
All Other Professional Workers	14	14	0	2	2
TOTAL TECHNICAL WORKERS	39	39	0	4	4
Civil Engineering Technicians	4	4	0	1	1
All Other Engineering Technicians	10	10	0	1	1
Science Technicians	21	21	0	2	2
All Other Technical Workers	4	4	0	0	0
TOTAL SERVICE WORKERS	65	64	0	9	9
Guards & Doorkeepers	16	16	0	1	1
Food Service Workers	31	30	0	5	5
Supervisors, Nonworking-Service	1	1	0	0	0
All Other Service Workers	17	17	0	3	3
TOTAL MAINTENANCE & PRODUCTION WORKERS	695	688	0	67	67
Mechanics, Automotive	11	11	0	1	1
Mechanics, Engineering-Equipment	44	43	0	4	4
Mechanics, Mine-Machinery	12	12	0	1	1
Mechanics, Maintenance	51	50	0	5	5
All Other Mechanics & Repairers	1	1	0	0	0
Truck Drivers	93	92	0	7	7
Blasters	8	8	0	0	0
Carpenters	9	9	0	1	1
Cement Masons	1	1	0	0	0
Crane, Derrick & Hoist Operators	4	4	0	0	0
Drier Operators, Coal or Ore	4	4	0	1	1
Drillers, Machine	17	17	0	2	2
Dump Operators	1	1	0	0	0
Electricians	36	35	0	3	3
Supervisors, Nonworking	72	71	0	8	8
Heavy Equipment Operators	68	67	0	6	6
Machinists	8	8	0	1	1
Trades Helpers	50	49	0	6	6
Oilers	19	19	0	2	2
Painters, Maintenance	6	6	0	1	1
Panelboard Operators	7	7	0	1	1
Plumbers &/or Pipefitters	7	70	0	1	1
Reagent Tenders	3	3	0	0	0
Welders & Flamecutters	28	28	0	3	3
Separator Tenders	11	11	0	1	1
Conveyor Operators/Tenders	1	1	0	0	0
Mill &/or Ore Grinders, Minerals	17	17	0	1	1
Pump Operators	7	7	0	1	1
Mixers &/or Blenders, Chemicals	6	6	0	1	1
All Other Skilled Craft Workers	21	21	0	2	2
All Other Operatives & Semiskilled Workers	5	5	0	0	0
All Other Laborers & Unskilled Workers	67	67	0	7	7
TOTAL CLERICAL WORKERS	102	101	0	17	17
Accounting Clerks	7	7	0	1	1
Cashiers	4	4	0	1	1
General Clerks, Office	13	13	0	3	3

ESTIMATED EMPLOYMENT AND JOB OPENINGS
MINING

YAVAPAI COUNTY (CONTD.)

	Estimated 1981 Employment	Projected 1985 Employment	Job Openings Due to Growth 1981-1985	Job Openings Due to Separations 1981-1985	Total Job Openings 1981-1985
Personnel Clerks	1	1	0	0	0
Receptionists	1	1	0	0	0
Secretaries	25	25	0	6	6
Clerical Supervisors	1	1	0	0	0
All Other Office Clerical Workers	5	5	0	1	1
Production Clerks &/or Coordinators	2	2	0	0	0
Shipping &/or Receiving Clerks	1	1	0	0	0
Stock Clerks	41	40	0	5	5
All Other Plant Clerical Workers	1	1	0	0	0
TOTAL SALES WORKERS	8	8	0	1	1
Sales Clerks	7	7	0	1	1
All Other Sales Workers	1	1	0	0	0
TOTAL ALL OCCUPATIONS	1,022	1,012	0	112	112

Confidential data for certain occupations have been added to "All" or "All Other" categories or collapsed into major occupational classes as follows:

PROFESSIONAL WORKERS

All Other Engineers
Metal Engineers

TECHNICAL WORKERS

All Other Engineering Technicians
Drafters

MAINTENANCE & PRODUCTION WORKERS

All Other Skilled Craft Workers
Dredge Operators
Drillers, Hand
Maintenance Repairers, General Utility

All Other Operatives & Semiskilled Workers
Industrial Truck Operators
Conveyor Operators/Tenders

All Other Laborers & Unskilled Workers
Mill &/or Grinder Operators, Minerals

METHODOLOGY

Limitations of the Data

The projection methods do not account for cyclical, seasonal, and such factors as the sudden opening and closing of large establishments. Caution is advised in the use of employment forecast data for industries with limited employment - especially in the smaller counties. The establishment or closing of a single firm could have a profound effect on a county's employment and demand.

The occupational data in this publication refer only to employees who earned a wage or salary. Self-employed and unpaid family workers are not represented in the statistics.

Sample Selection and Response Rate

Occupational estimates for the mining industry were developed from a survey of employers throughout the state. Employers who were asked to participate in the survey were selected from a master employer file of firms doing business in Arizona, using standardized sampling techniques. A sample of establishments employing 4-99 employees and all establishments having 100 or more employees were surveyed. The entire sample was composed of 160 firms with a usable response rate of 69 percent. Firms responding, however, accounted for 91 percent of the industry's employment.

Employment Projections

Mining employment was projected to 1985 using regression analysis and was adjusted to reflect recent industry developments. The 1985 occupational employment was calculated by applying staffing pattern ratios (as determined by the survey) to the industry projections.

Job Openings

The difference between 1981 and 1985 employment for each occupation represents expected job openings due to growth. Job openings due to separations were calculated by interpolating 1970 and 1985 separation rates for each occupation[1] and applying them to the occupational employment projections. "Total job openings" is the sum of openings due to growth and separations. These data do not include openings resulting from turnover, i.e., openings created when a worker changes jobs.

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[1]"Tomorrow's Manpower Needs," Supplement No. 4, BLS, 1974, pp. 11-16.

SOURCES OF ADDITIONAL INFORMATION

Further information about jobs in the mining industry may be available from the personnel offices of individual companies.

General information on mining occupations is available from:

United Mine Workers of America, 900 15th St. N.W.,
Washington, D.C. 20005

Mine Safety and Health Administration, 4015 Wilson Blvd.,
Arlington, VA 22203